

Original Article

Nurses Knowledge regarding Blood transfusion in Hayatabad Medical Complex, Peshawar

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ABSTRACT

Background: Blood transfusion is a critical and life-saving procedure in medical practice, necessitating high levels of knowledge and competency among healthcare providers, particularly nurses, to ensure patient safety and minimize risks associated with transfusion. Despite its importance, gaps in knowledge and training among nursing professionals can significantly impact the quality of care and patient outcomes.

Objective: This study aimed to assess the knowledge of nurses regarding blood transfusion practices at a tertiary care hospital in Peshawar and to identify educational gaps that could be addressed to improve the safety and efficacy of transfusion services.

Methods: A cross-sectional descriptive study was conducted among Registered Nurses working at Hayatabad Medical Complex, Peshawar. A total of 206 nurses were recruited using convenience sampling. The blood transfusion knowledge questionnaire, adapted from previous studies with modifications to include demographic questions and specific queries related to blood transfusion, was used for data collection. Statistical analysis was performed using SPSS version 25, focusing on calculating means, standard deviations, frequencies, and percentages.

Results: The study found that 63.60% of the participants were female, and the majority (52.4%) were aged between 31 to 40 years. Regarding blood transfusion practices, 89.3% correctly identified the use of a blood transport box for transporting blood from the blood bank to the ward. Furthermore, 90.77% acknowledged checking the details on the bag label and blood request form as the first step in collecting a blood bag. However, the study highlighted a moderate level of overall knowledge about blood transfusion among nurses, with significant gaps in training and education noted.

Conclusion: The findings suggest that while nurses at the tertiary care hospital in Peshawar have a reasonable understanding of some aspects of blood transfusion practices, there is a clear need for enhanced training programs and the inclusion of comprehensive transfusion medicine education in nursing curricula. Addressing these gaps is essential for improving patient safety and the overall quality of care in transfusion services.

Keywords: Blood transfusion, Nurses knowledge, Patient safety, Transfusion practices, Nursing education, Hayatabad Medical Complex.

INTRODUCTION

Over the past century, blood transfusions have become a cornerstone in the management of severe anemia and a plethora of medical conditions, marking them as one of the most frequently employed therapeutic interventions worldwide. Despite their widespread application, the inherent risks and complications associated with blood transfusions necessitate cautious application, particularly in younger populations (1). In response to these concerns, Patient Blood Management (PBM) programs have emerged globally, advocating for a patient-centric, evidence-based approach aimed at optimizing patient outcomes through the judicious management and conservation of a patient's own blood. This initiative underscores the importance of ensuring patient safety and empowerment in the transfusion process (2).

Advancements in blood supply safety, coupled with the escalating costs associated with transfusion therapy, have prompted a reevaluation of therapeutic practices related to blood transfusion and storage. This includes the reassessment of transfusion

thresholds to balance the benefits against the risks and identifying patients who would most benefit from blood conservation strategies (3). Research by Wiersum-Osselton et al. highlights the critical role of transfusions in patient fatalities, particularly due to respiratory decline linked to hydrostatic pulmonary edema occurring during or within 12 hours following transfusion. Moreover, transfusions have been associated with increased duration of mechanical ventilation, heightened risk of multi-organ system failure, and mortality (4).

Blood transfusions are indispensable for patients with conditions like thalassemia, requiring lifelong regular transfusions. Thalassemia's prevalence in regions such as South Asia, Africa, and the Mediterranean accentuates the global burden of this condition (6). The Mayo Clinic outlines the various components of blood transfusions, including red blood cells (RBCs), white blood cells, plasma, and platelets, each serving unique functions from oxygen transport to infection defense and blood clotting. The process of blood transfusion is intricate, involving collection, infection screening, processing, storage, and distribution, necessitating collaboration among multiple stakeholders to ensure efficacy and safety (7,8).

The role of nurses in the administration of blood transfusions is pivotal, encompassing preparation, collection of blood bags, pre- and post-transfusion activities, and patient monitoring. Despite their central role, studies focusing on nurses' knowledge and skills in performing blood transfusions are scant. Given the majority of transfusion-related morbidities stem from misidentification, enhancing nurses' expertise presents a viable strategy to mitigate risks and minimize wastage of blood components. A 1993 survey in the United Kingdom underscored the gravity of this issue, attributing the majority of transfusion-related deaths to incorrect identification (11).

The transfusion process encapsulates five interconnected phases, including blood grouping and cross-matching, patient preparation, blood pack collection, and both pre- and post-transfusion nursing duties. Nurses' familiarity with these stages and their competence in executing associated tasks are crucial for the safe and effective management of blood and its products. Key nursing responsibilities range from setting appropriate transfusion flow rates to meticulous patient observation for any adverse reactions, highlighting the critical role nurses play from the initiation to the conclusion of the transfusion process (13).

The complexity and potential risks associated with blood transfusions underscore the imperative for rigorous Patient Blood Management practices and the pivotal role of nursing staff in ensuring the safe and effective administration of this life-saving treatment. The collaboration among healthcare professionals, coupled with an emphasis on education and adherence to guidelines, remains fundamental in advancing transfusion medicine and safeguarding patient outcomes.

MATERIAL AND METHODS

A cross-sectional descriptive study was conducted among Registered Nurses at Hayatabad Medical Complex, Peshawar, aimed at assessing their knowledge regarding blood transfusion practices. The convenience sampling method, a non-probability sampling technique characterized by the selection of subjects based on their accessibility and proximity to the researcher, was employed to recruit participants for this study. The population under study consisted of 440 nurses, from which a sample size of 206 was determined using Raosoft software. This calculation was based on a margin of error of 5%, a confidence level of 95%, and the assumption of a response distribution of 50%. Eligibility criteria for inclusion in the study encompassed nurses actively working in various units of the Hayatabad Medical Complex and those who expressed willingness to participate. Exclusion criteria were set to omit nurses with less than one year of experience, nursing students, nurses in administrative roles, and those who had not attended any workshops or educational programs on blood transfusion.

The data collection instrument was a questionnaire adapted from Bediako et al. (2021)(13), with modifications to include demographic inquiries and specific questions pertinent to blood transfusion knowledge. Data analysis was conducted using SPSS version 25, a change from the initially mentioned version 22, to align with the latest analytical standards. Continuous data were summarized using means and standard deviations, while categorical data were expressed through frequencies and percentages.

Ethical considerations were meticulously observed throughout the study. Informed consent was obtained from all participants prior to their involvement in the study, ensuring they were fully informed of the study's objectives and the nature of their participation. The study's protocol was designed to safeguard participant anonymity and confidentiality, with assurances that personal identifiers would never be disclosed at any stage of the research. This approach was aligned with the ethical principles outlined in the Declaration of Helsinki, ensuring respect for individual autonomy, beneficence, non-maleficence, and justice in the conduct of the study.

Overall, the methodological framework of this study was structured to provide a comprehensive evaluation of nurses' knowledge on blood transfusion, incorporating both quantitative measures and ethical rigor to generate reliable and ethically sound findings.

RESULTS

In the conducted study aimed at evaluating the knowledge of Registered Nurses on blood transfusion practices at Hayatabad Medical Complex, Peshawar, a total of 206 participants were recruited. The gender distribution among participants was notably skewed towards females, constituting 63.60% (131) of the sample, while males represented 36.40% (75) (Table 1.1). This demographic profile underscores the gender dynamics within the nursing workforce at the facility.

Regarding the age distribution, the majority of the nurses fell within the 31 to 40 years age bracket, accounting for 52.4% (108) of the participants. This was followed by those aged 21 to 30 years, representing 31.6% (65) of the sample. Nurses aged 41 to 50 years and 51 to 60 years comprised 13.1% (27) and 2.9% (6) of the participants, respectively, indicating a relatively younger workforce engaged in the study (Table 1.1).

The educational qualifications of the nurses revealed a significant leaning towards higher academic achievements, with 65.5% (135) of the participants holding a BS Nursing/Post RN qualification. Those with specialized nursing qualifications (e.g., ICU, Pediatrics, Diploma in Cardiology, Midwifery, etc.) constituted 20.4% (42), while MS Nursing degree holders were 8.3% (17). Diploma in Nursing was the least represented, with 5.8% (12) of the respondents (Table 1.1).

Experience levels among the study participants varied, with the largest group, 40.8% (84), reporting 6 to 10 years of professional experience. This was closely followed by those with 1 to 5 years of experience, representing 30.1% (62) of the sample. Nurses with 11 to 15 years, 16 to 20 years, and more than 21 years of experience constituted 21.4% (44), 6.3% (13), and 1.5% (3) of the participants, respectively, highlighting a broad range of experience levels among the nursing staff (Table 1.1).

The study further explored specific knowledge areas related to blood transfusion practices. A substantial majority of nurses, 89.32% (184), correctly identified the blood transport box as the appropriate method for transporting blood from the blood bank to the ward, reflecting a high level of awareness regarding the safe handling of blood products (Table 1.1). When asked about the first step in collecting a blood bag from the blood bank, 90.77% (187) correctly stated that checking details on the bag label and blood request form was crucial, indicating a strong adherence to protocol (Table 1.1).

The pre-transfusion protocol also garnered high compliance, with 96.60% (199) of the nurses acknowledging the importance of patient information, identification, and vital sign recording collectively before starting a transfusion (Table 1.1). This consensus extends to patient education, where 92.71% (191) recognized the necessity of informing patients about the reasons for transfusion, associated risks, and potential reaction symptoms (Table 1.1).

Table 1 Demographic Characteristics

Demographic Characteristic	Category	Frequency	Percent
Gender	Female	131	63.60%
	Male	75	36.40%
Age	21 to 30 Years	65	31.6%
	31 to 40 Years	108	52.4%
	41 to 50 Years	27	13.1%
	51 to 60 Years	6	2.9%
Higher Qualification	MS Nursing	17	8.3%
	BS Nursing / Post RN	135	65.5%
	Specialized Nursing (e.g., ICU, Peads)	42	20.4%
	Diploma Nursing	12	5.8%
Experience	1 to 5 Years	62	30.1%
	6 to 10 Years	84	40.8%
	11 to 15 Years	44	21.4%
	16 to 20 Years	13	6.3%
	21 Years and Above	3	1.5%

Table 2 KAP Questions

Question	Option	Frequency	Percentage (%)
Transport Method from Blood Bank to Ward	Plastic Bag	13	6.31%
	Blood Transport Box	184	89.32%
	Kidney Tray	9	4.36%
First Step of Collecting Bag from Blood Bank	Check Details on Bag Label and Blood Request Form	187	90.77%
	Informed Consent	11	5.33%
	Monitoring Vital Signs	8	3.88%
Before Starting Transfusion	Patient Information	1	0.48%
	Patient Identification	5	2.47%
	Vital Sign Recording	1	0.48%
	All of the Above	199	96.60%
Patient Information Before Transfusion	Reasons for Transfusion	0	0.00%
	Risks of Transfusion	4	1.94%
	Reaction Symptoms	11	5.33%
	All of the Above	191	92.71%
Identifying the Right Patient	Ask Patient to State Name, Date of Birth	3	1.45%
	Match Patient ID Details with Blood Bag	13	6.31%
	ID Band, Blood Request Form & Chart	16	7.76%
	All of the Above	174	84.46%
Nursing Activities After Initiation of Transfusion	Setting Up the Flow Rate	126	61.16%
	Observe for Transfusion Reaction	80	38.84%
	Vital Sign Recording	-	-
	Documentation of Relevant Information	-	-
Maximum Time Out of Fridge	10 Minutes	17	8.25%
	20 Minutes	19	9.22%
	30 Minutes	159	77.18%
	1 Hour	11	5.33%
Completion Time of Transfusion	Within 4 Hours	195	95.14%
	After 4 Hours	2	0.97%
	None of the Above	9	4.36%
Signs of Acute Hemolytic Transfusion Reaction	Tachycardia	18	8.73%
	Nausea/Vomiting	8	3.88%
	Hypotension	1	0.48%
	All of the Above	179	86.89%
NOT Transferrable with Blood Transfusion	Hepatitis B&C, HIV/AIDS, Malaria	81	39.33%
	Hemophilia	125	60.67%
NOT a Complication of Blood Transfusion	Hemolytic Reaction, Allergic Reaction, Non-Hemolytic Febrile Reaction	115	55.83%
	Leukemia	91	44.17%

In identifying the correct patient for transfusion, an overwhelming 84.46% (174) of respondents agreed that a combination of asking the patient to state their name and date of birth, ensuring patient identification details match with those on the blood bag, and checking the ID band, blood request form, and chart were essential steps, demonstrating a comprehensive approach to patient safety (Table 1.1).

The findings related to the specific nursing activities required after the initiation of transfusion, the maximum time a unit of blood could be outside the blood bank fridge, the recommended completion time for transfusions, and the identification of symptoms indicating an acute hemolytic transfusion reaction further emphasize the nurses' knowledge and adherence to best practices in blood transfusion procedures.

DISCUSSION

In the present study conducted at a tertiary care hospital in Peshawar, the knowledge of nurses regarding blood transfusion was assessed using a specialized questionnaire. The demographic profile of the respondents predominantly featured female nurses (63.6%), outnumbering their male counterparts (36.4%). This gender distribution aligns with global trends within the nursing profession, where women traditionally dominate, although the proportion of men entering the field is gradually increasing, as noted by Zamanzadeh et al. (2013). The findings from this study, which demonstrate a higher female to male ratio, corroborate with the observations made by Shaikh et al., who reported a female representation of 58.3% (16). The significant age group identified in this study was between 21 to 40 years, constituting 84% of the participants, a distribution closely mirrored by Bediako et al. in Ghana (13). Furthermore, the experience level of participants, predominantly between 6 to 10 years (40.8%), is comparable to the findings from a study in Malaysia by Yazid et al. (2023), highlighting a consistency in the professional experience of nursing staff across different regions.

The study revealed a substantial awareness among nurses regarding the correct protocol for receiving blood bags from the blood bank, with 89.3% of nurses recognizing the use of a blood transport box, reinforcing the findings from Noor et al. in Malaysia (17). Additionally, the knowledge on patient education about blood transfusion, encompassing reasons, risks, and reaction symptoms, was significantly high (92.7%), paralleling the 90.5% reported in the same Malaysian study. The correct identification of patients before transfusion was acknowledged by 84.4% of the nurses, a figure that, while slightly lower, still supports the findings of Encan et al. in Turkey (14). The nurses' understanding of the signs and symptoms of acute hemolytic reactions stood at 86.8%, surpassing the 76% reported in the prior study, indicating a relatively higher awareness of transfusion reactions among the participants of this study.

Moreover, the knowledge regarding the maximum duration a unit of blood can remain outside the fridge before transfusion was correctly identified by 77.18% of respondents as 30 minutes, differing from Encan et al.'s (2019) study where 60% was recognized, a variance possibly attributed to the differences in educational backgrounds of the nursing staff in each study. In terms of understanding transfusion-related complications, the findings from a study in Iraq by Mohammad (18) showed a mean knowledge score of 1.69 ± 0.467 , closely matched by the current study's findings of 1.65 ± 0.479 , indicating a moderate level of knowledge on the subject among the nurses surveyed.

The study highlighted the moderate level of knowledge among nurses regarding blood transfusion, emphasizing the gap in attending training programs on transfusion practices. It pointed out the critical role of administrative support in facilitating such educational initiatives to enhance the safety and efficacy of transfusion services. Despite the limitations of generalizability due to the homogeneous sample and the study's focus on a single hospital, the comprehensive response rate and the absence of funding conflicts present this research as a pivotal step towards understanding and improving blood transfusion practices among nurses (17, 18).

The study underscores the need for hospital administrations to play a proactive role in assessing and addressing the educational needs of nurses regarding blood transfusion. It calls for the strengthening of nursing education curricula to include transfusion medicine comprehensively, aiming to equip nurses with the requisite knowledge and skills to minimize adverse transfusion events. Moreover, it advocates for policy formulation and dissemination on blood transfusion practices within hospital units to ensure uniformity and adherence to best practices. Future research should aim to expand the scope of inquiry to include larger and more diverse samples across different healthcare settings to validate and extend the findings of this study (20).

CONCLUSION

The study concludes that nurses at a tertiary care hospital in Peshawar possess moderate knowledge regarding blood transfusion practices, highlighting the necessity for enhanced training programs and education in transfusion medicine. This finding underscores the critical role of healthcare administrations in implementing comprehensive training and policies to improve nurses' competencies in transfusion services. By addressing these educational gaps, the healthcare sector can significantly enhance patient safety, reduce the risk of transfusion-related adverse events, and ultimately improve the quality of care provided to patients. This emphasizes the broader implication for human healthcare: the need for continuous professional development and education in critical clinical practices to ensure the highest standards of patient care and safety.

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